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BRANCHED BROOMRAPE, OROBANCHE RAMOSA, AN ECONOMICALLY IMPORTANT PARASITIC WEED NOT CURRENTLY KNOWN IN FLORIDA

K. R. Langdon[1]

Several species of Orobanche are important root parasites of cultivated crops. Most of these species are native to the Mediterranean area and the Near or Middle East. One of these species, Orobanche ramosa L., is established in the U.S. Here it is called branched broomrape, and it parasitizes various wild and cultivated plants, especially several economic plants in the family Solanaceae. Branched broomrape (Fig. 1A and 1B) is a small plant 4 to 12 inches (10-30 cm) tall, yellow, sometimes tinged purplish, without chlorophyll and with white to pale yellow or purplish to bluish small flowers. Leaves are reduced to scales. It is often concealed beneath the host plant foliage.

Fig. 1. Orobanche ramosa. A) Plant with hosts. Some material removed to expose plant. B) Closeup of flower spike. (Photos by C. A. Field, Texas Dept. Agric.)

DESCRIPTION: Plant annual, biennial, or perennial, depending mainly on host; stems 10-40 cm tall, swollen at base, attached to host roots, simple or branched, glandular puberulent; leaves reduced to scales, 3-10 mm, ovate to ovate-lanceolate, acute; inflorescence 2-25 cm, lax to moderately dense, glandular pubescent; bracts 6-10 mm, ovate-lanceolate; bracteoles linear-lanceolate, about equalling calyx; pedicels 0-8 mm; entire plant lacking chlorophyll, yellow or yellowish violet; calyx 6-8 mm; corolla 10-22 mm; glandular-pubescent, suberect and inflated at base, white or yellow to violet or bluish, usually pale; filaments inserted 3-6 mm above base of corolla; stigma white, cream or pale blue; capsule 6-10 mm containing numerous dust-like seeds. Plants highly variable where native; less so in introduced populations (5,8,10).

DISTRIBUTION: Orobanche ramosa is native to the Mediterranean area of southern Europe but has been spread to a number of other parts of the world. Present distribution includes southern Europe (occasionally introduced farther north) to Russia and Siberia. It is also present in northern and southern Africa and the Middle East (3,9,10,12). In the Americas, O. ramosa has been introduced and is established in the U. S., Mexico, and Cuba. It was reported at one time infesting hemp and tobacco in Kentucky (6,7,9).

[1]Botanist, Office of Systematic Botany, P. O. Box 1269, Gainesville, FL 32602

It also has been reported (although some of these reports may be questionable or one-time reports) in Illinois, Ohio, and Wisconsin. None of these infestations persisted (2,9). It was later found in New Jersey and on Long Island, New York. These infestations apparently have since been eliminated (6,7). An infestation on tomato in California was first reported in 1929 and still remains a problem there (6,9). In 1981, O. ramosa was reported in Texas on various wild plants (4,7). An eradication campaign has been initiated to eliminate this infestation.

HOSTS: Orobanche ramosa has a wide host range. Different populations appear to vary in their host ranges, though the exact extent of variation is not known. Table 1 lists hosts reported for O. ramosa (1,2,7,9,12). A number of other plants have been reported as doubtful hosts (2), but since there is uncertainty as to the correct identity of either the parasite or host species, these will not be repeated here.

Table 1. Hosts of *Orobanche ramosa*

Amaranthus retroflexus L.	*Daucus carota* L.	*Oxalis corniculata* L.
Ammi majus L.	*Engelmannia pinnatifida* Gray ex Nutt.	*Pelargonium zonale* (L.) L'Her. ex Soland.
Armoracia rusticana P. Gaertn., B. Meyer & Schreb.	*Erigeron geiseri* Shinners	*Penstemon gentainoides* (H.B.K.) Poir.
Artemisia biennis Willd.	*Eryngium creticum* Lam.	*Perilla frutescens* (L.) Britton 'Crispa'
Begonia semperflorens Link & Otto	*Eupatorium ligustrinum* DC.	*Petunia* X *hybrida* Hort. Vilm.-Andr.
Brassica napus L.	*Galium tricornutum* Dandy	*Salvia coccinea* Juss. ex J. Murr.
B. oleracea L.	*Gaura brachycarpa* Small	*S. splendens* Sellow
B. rapa L.	*Geranium texanum* (Trelease) A. Heller	*Silene antirrhina* L.
Callirhoe leiocarpa R. F. Martin	*Heliotropium arborescens* L.	*Solanum melongena* L.
Cannabis sativa L.	*Lactuca sativa* L.	*S. nigrum* L.
Capsella bursa-pastoris (L.) Medic.	*Lagenaria siceraria* (Molina) Standl.	*S. pseudocapsicum* L.
Capsicum annuum L.	*Lamium album* L.	*S. sarrachoides* Sendtn.
Chaerophyllum tainturieri Hook	*L. maculatum* L.	*S. tuberosum* L.
Chenopodium album L.	*L. purpureum* L.	*Taraxacum kok-saghyz* Rodin
Coleus sp.	*Lepidium virginicum* L.	*Tropaeolum majur* L.
Conium maculatum L.	*Leucas martinicensis* R. Br.	*Verbena* sp.
Coreopsis basalis (A. Dietr.) Blake	*Lycopersicon esculentum* Mill.	*Veronica* sp.
Cucumis melo L.	*Malva parviflora* L.	*Vicia faba* L.
C. sativus L.	*Melilotus alba* Medic.	*Vitis vinifera* L.
Cucurbita pepo L.	*M. indica* (L.) All.	*Xanthium spinosum* L.
Cuphea ignea A. DC.	*M. officinalis* (L.) Lam.	*X. strumarium* L.
	Nicotiana tabacum L.	

ECONOMICS: Orobanche ramosa parasitizes the roots of susceptible hosts, such as tomato, causing stunting and reducing yields as much as 51% (1). Some infested tomato fields in California have become unprofitable as a result of branched broomrape infestations. It grows well in alkaline soils (5) and so probably would be well adapted to the limestone and marl soils of South Florida where much of Florida's winter tomato production occurs.

REPRODUCTION AND CONTROL: Each plant produced an average of around 100 seed capsules containing about 2,000 seeds each, or a total of 200,000 seeds per plant (11). These seeds are capable of lying dormant in the soil in the absence of a suitable host for at least 13 years (2,9) and still germinate when host roots are available. This makes control or eradication very difficult. An indication has been obtained (4) that flax will cause germination of O. ramosa seed but will not support growth or reproduction (suicidal germination). This factor needs further study. Herbicidal treatments to prevent seeding offer some promise.

SURVEY AND DETECTION: Look for small plants, often covered by host plant and other foliage, light yellow or tinged purplish, with small tubular flowers white, light yellow, or pale purplish color. Many situations can be checked, but a prime survey area would be tomato fields at around pink fruit stage. Lift foliage and look underneath.

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